

What is claimed is:

1. A solid-state image pickup device including pixels each of which comprises a photodiode, a detection portion and a transfer transistor for transferring charges accumulated in the photodiode to the detection portion, wherein the gate voltage of said transfer transistor when the charges are accumulated in said photodiode is set to a negative voltage.
2. The solid-state image pickup device as claimed in claim 1, wherein the negative voltage is set to a voltage under which a channel portion below the gate of said transfer transistor is inverted.
3. The solid-state image pickup device as claimed in claim 1, wherein the negative voltage is set to $-0.5V$ or less.
4. A solid-state image pickup device including pixels each of which comprises a photodiode, a detection portion and a transfer transistor for transferring charges accumulated in the photodiode to the detection portion, wherein the gate voltage of said transfer transistor when the charges are accumulated in said photodiode is set to a positive voltage.
5. The solid-state image pickup device as claimed in claim 4, wherein the positive voltage is set to a voltage under which a channel portion below the gate of said transfer transistor is inverted.
6. The solid-state image pickup device as claimed in claim 4, wherein the positive voltage is set to a power source voltage

or more.

7. The solid-state image pickup device as claimed in claim 1, wherein an area extending from the portion just below said photodiode to a semiconductor substrate in each pixel is formed of an n-type semiconductor region having an impurity concentration lower than that of a semiconductor well region or a p-type semiconductor region.

8. The solid-state image pickup device as claimed in any one of claims 1 and 4, wherein the area between said photodiode and said detection portoin in each pixel is formed of an n-type semiconductor egion having an impurity concentration lower than that of a semiconductor well region or a p-type semiconductor region.

9. The solid-state image pickup device as claimed in any one of claims 1 and 4, wherein an area extending from the portion just below said photodiode and the area between said photodiode and said detection portion to a semiconductor substrate in each pixel is formed of an n-type semiconductor region having an impurity concentration lower than that of a semiconductor well region or a p-type semiconductor region.

10. A solid-state image pickup device including pixels each of which comprises a photodiode, a detection portion and a transfer transistor for transferring charges accumulated in said photodiode to said detection portion, wherein an overflow path for discharging charges overflowing from said photodiode

is formed in a bulk out of a channel portion of said transfer transistor.

11. The solid-state image pickup device as claimed in claim 10, wherein said overflow path is formed of an area extending from the portion just below said photodiode to a semiconductor substrate, and said area is formed of an n-type semiconductor region having an impurity concentration lower than that of a semiconductor well region or a p-type semiconductor region.

12. The solid-state image pickup device as claimed in claim 10, wherein said overflow path is formed in the area between said photodiode and said detection portion, and said area is formed of an n-type semiconductor region having an impurity concentration lower than that of a semiconductor well region or a p-type semiconductor region.

13. The solid-state image pickup device as claimed in claim 10, wherein said overflow path is formed in an area extending from the portion just below said photodiode and the area between said photodiode and said detection portion to a semiconductor substrate, and said area is formed of an n-type semiconductor region having an impurity concentration lower than that of a semiconductor well region or a p-type semiconductor region.

14. A method of driving a solid-state image pickup device including pixels each of which comprises a photodiode, a detection portion and a transfer transistor for transferring charges accumulated in the photodiode to the detection portion,

wherein the gate voltage of said transfer transistor when the charges are accumulated in said photodiode is set to a negative voltage.

15. The solid-state image pickup device driving method as claimed in claim 14, wherein the negative voltage is set to a voltage under which a channel portion below the gate of said transfer transistor is inverted.

16. The solid-state image pickup device driving method as claimed in claim 14, wherein the negative voltage is set to -0.5V or less.

17. The solid-state image pickup device driving method as claimed in claim 14, wherein the charges overflowing from said photodiode are discharged to the substrate side.

18. The solid-state image pickup device driving method as claimed in claim 14, wherein the charges overflowing from said photodiode are discharged to the detection portion side through the lower side of the channel portion of said transfer transistor.

19. The solid-state image pickup device driving method as claimed in claim 14, wherein the charges overflowing from said photodiode are discharged to both the substrate side and the detection portion side through the lower side of the channel portion of said transfer transistor.

20. A method of driving a solid-state image pickup device including pixels each of which comprises a photodiode, a

detection portion and a transfer transistor for transferring charges accumulated in the photodiode to the detection portion, wherein the gate voltage of said transfer transistor when the charges are accumulated in said photodiode is set to a positive voltage.

21. The solid-state image pickup device driving method as claimed in claim 20, wherein the positive voltage is set to a voltage under which a channel portion below the gate of said transfer transistor is inverted.

22. The solid-state image pickup device driving method as claimed in claim 20, wherein the positive voltage is set to a power source voltage or more.

23. The solid-state image pickup device driving method as claimed in claim 20, wherein the charges overflowing from said photodiode are discharged to the substrate side.

24. The solid-state image pickup device driving method as claimed in claim 20, wherein the charges overflowing from said photodiode are discharged to the detection portion side through the lower side of the channel portion of said transfer transistor.

25. The solid-state image pickup device driving method as claimed in claim 20, wherein the charges overflowing from said photodiode are discharged to both the substrate side and the detection portion side through the lower side of the channel portion of said transfer transistor.